

Report on Review of Core Content Program Alignment to the Arizona Mathematics Standard (K-8)

***AZ Academic Standards Unit
Standards and Assessment Division
Arizona Department of Education***

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The Arizona Department of Education AZ Academic Standards office would like to extend our thanks and appreciation to the Review of Core Content Programs for Mathematics, Science, and Social Studies Standards Alignment Panel members for their commitment of time and conscientious work in providing this guidance to schools. We also extend thanks to the publishers of content materials and their sales representatives who participated in this project. Through shared accountability and the cooperative efforts of many, we will reach our common goal of implementation of the Arizona Academic Standards.

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Introduction

The Arizona Department of Education (ADE) is committed to support and assist schools in implementing the Arizona Academic Standards so that all Arizona's students have the opportunity to learn them. With that goal in mind, and to be responsive to the field, the ADE conducted a series of analyses of the alignment of reading, mathematics, science, and social studies programs to the Arizona Standards. The Arizona Department of Education AZ Academic Standards Unit is providing this information as a service to Arizona districts and schools to assist them in making informed choices regarding the selection and use of instructional materials. This report includes the review of core content program alignment with the Arizona Mathematics Standard (K-8).

How Arizona Districts Might Use This Information ...

- To identify those core content programs in mathematics that they would analyze in greater depth to determine which is the best match for their student and teacher needs;
- To support their selection of a core content program in mathematics;
- To assist in curriculum development, curriculum mapping, and the alignment process.

How Arizona Schools and Teachers Might Use This Information ...

- To identify areas that may need augmentation in core content programs in mathematics;
- To support their selection of a core content program in mathematics;
- To assist in curriculum development, curriculum mapping, and the alignment process.

Purpose of the Review of Core Mathematics Program Alignment to the Arizona Mathematics Standard

The Arizona Department of Education AZ Academic Standards Unit is providing summary information as a service to Arizona districts and schools to assist them in making informed choices regarding the selection and use of core content programs that are aligned to the Arizona Articulated Mathematics Standard.

The Arizona Review of Core Content Programs for Mathematics Standard Alignment had three objectives:

- 1) Analyze the core program and determine the degree to which the content of the lesson(s) aligns with the Grade Level Expectation.
- 2) Analyze the core program and determine the degree to which the cognitive demand of the lesson(s) aligns with the Grade Level Expectation.
- 3) Analyze the core program and examine the context of the lesson(s) to determine the type and number of opportunities that are available for students to apply their understanding of the Grade Level Expectation.

This report is released with the following clarifications:

What It is *Not*...

- It in no way constitutes an approved or recommended textbook/program adoption list for Arizona schools or an endorsement of any program;
- It is not an all-inclusive list; it includes only those publishers who chose to submit materials for review upon invitation;
- It is an important, but not the only factor that districts and schools need to consider when selecting core content materials.

What It *Is*...

- An analysis of a core mathematics program's alignment to the Arizona Articulated Mathematics Standard based on content, cognitive demand, and context.

Selection of Panel Members for Review of Core Program Alignment to the Mathematics Standard

The Arizona Department of Education issued a call to educators across the state to serve on the Core Content Program Review Panel for Mathematics Standard Alignment. Panel members were selected based on their knowledge of and experience implementing the Arizona Articulated Mathematics Standard. The Panel represented both urban and rural districts from various geographic regions in Arizona. The Panel reviewed and analyzed all submitted materials. The Arizona Department of Education AZ Academic Standards staff members provided the training, facilitated the work of the Panel, and assisted Panel members, but did not participate in the analysis of the materials submitted.

Process of the Review of Core Content Program Alignment to the Mathematics Standard

Announcements were posted on the ADE website inviting publishers to submit for review their core K-3 and 4-8 mathematics programs including teacher guides, student texts, alignment documents, and ancillary/support pieces that were considered components of a standard adoption. Publishers were informed of the purpose of this review and that only core content programs would be reviewed.

A core K-8 mathematics program:

- is the principle instructional tool that teachers use to teach children mathematics in order to achieve at or above grade level;
- meets the instructional needs of all children within the classroom through differentiation of instruction;
- is guided by ongoing assessment;
- addresses all strands of the Mathematics Standard systematically and coherently; and
- can be enriched by other materials and strategies to provide a comprehensive, coordinated program of instruction.

Publishers were informed that this review was voluntary and was not for the purpose of establishing an adopted or approved list of core content programs for the state of Arizona. Panel committee members were provided with one half-day of training and practice using the ADE rubric. Members were organized into teams of two to four people. All materials were reviewed in pairs. All differences of opinion were resolved in consensus discussions. Alignment scores were recorded after consensus was reached.

Teachers' guides, representative student materials, and ancillary/support materials that are received as part of a standard adoption were thoroughly examined to determine the degree of alignment to our Arizona Mathematics Standard based on three elements: content, cognitive demand, and context. Each of these three elements were scored using the following assignments: *Exceeds the Standard (4)*, *Meets the Standard (3)*, *Approaches the Standard (2)*, *Falls Far Below the Standard (1)* or *Not Observed (0)*.

After all the results were compiled and summarized, publishers were given the opportunity to review and discuss results with ADE staff prior to publication.

Program Reviews – Reading the Tables

Table - Alignment Summary for the Arizona Mathematics Standard

Example of Table for Mathematics: Grade 2

Publisher: ABCD			
	Content (4 pts max per PO)	Cognitive Demand (4 pts max per PO)	Context (4 pts max per PO)
Strand 3: Patterns, Algebra, and Functions			
Strand 3, Concept 1: Patterns			
PO1	3	3	2
PO2	2	2	1
PO3	3	4	2
Strand 3, Concept 2: Functions and Relationships			
PO1	0	N/A	N/A
Strand 3, Concept 3: Algebraic Representations			
PO1	3	3	1
PO2	3	3	4
Strand 3, Concept 4: Analysis of Change			
PO1	3	3	2
PO2	2	2	1

**KEY: 4 (Exceeds the Standard) 3(Meets the Standard) 2(Approaches the Standard)
1 (Falls Far Below the Standard) 0(Not Observed)**

As shown in the example of the table above, the review of **Publisher Program ABCD** for alignment to Strand 3-Concept 1-Performance Objective 1, resulted in the following ratings: **3** (meets the standard) for content, **3** (meets the standard) for cognitive demand, and **2** (approaches the standard) for context. See rubric for specific descriptions for each rating (page 6).

As shown in the table, the review of **Publisher Program ABCD** for alignment to Strand 3-Concept 2-Performance Objective 1, resulted in the rating of **0** (not observed) for content. Since the program received a 0 for content, the remaining elements of cognitive demand and context were recorded as **Not Applicable (N/A)**.

Special Considerations of the Mathematics Alignment Review

The following factors were addressed by the review committees and need to be considered when using the alignment review.

- 1. Textbooks often cover additional content not included in our standard.** The committee only reviewed the sections of the books that corresponded to concepts in each grade level standard, even if the text covered more content. Therefore, additional content may be taught in a portion of the book not reviewed by the committee.
- 2. All bullets and i.e. items must be included for full alignment (Content score of 3).** If a bulleted or an i.e. item was missing from the content, the textbook could not receive a Content score higher than a 2 for that objective. E.g. items did not have to be included but other appropriate examples must be used in the content.
- 3. Alignment to our standard may be addressed in other, non-core components of the programs.** Textbook companies often offer other supplemental materials in their programs which may address concepts

and performance objectives missing in their core textbook. Since there is an additional cost for these materials, or they are accessed through online resources, the committee did not review them. The only materials reviewed were teachers' guides, representative student materials, and ancillary/support materials that are received as part of a standard adoption and considered core components of the program.

Alphabetical List of Reviewed Publishers

A total of 12 publishers submitted a core mathematics program (K-8) for review. These publishers are listed below in alphabetical order. Publishers did not receive a total score or ranking as a result of this analysis. All summary reports are available now upon request unless a later availability date is noted below.

Glencoe: Glencoe Mathematics: Applications and Concepts, Course 1, 2, and 3, 2006, Grades 6-8 and Glencoe Pre-Algebra, 2008, Grade 8 **(Available September 2007)**

Harcourt: Harcourt Math, 2007, (Grades K-6) and Think Math, 2008, (Grades K-6)

Holt: Holt Mathematics, Course 1, 2, and 3, 2007, Grades 6-8 **(Available September 2007)**

Houghton Mifflin: Houghton Mifflin Math, 2007, (Grades K-6) and Math Expressions, 2006, (Grades K-5) **(Math Expressions Available August 2007)**

Kendall/Hunt Publishing: Math Trailblazers, 2004, (Grades 4-5)

Macmillan McGraw-Hill: Math, 2005, (Grades K-6) and Growing with Mathematics, 2004, (Grades K-5)

Math Learning Center: Bridges in Mathematics, 2006, (Grade 4)

McDougal Littell, Math, Course 1, 2, and 3, 2007, Grades 6-8 **(Available September 2007)**

Pearson Prentice Hall: Connected Mathematics 2, 2006, (Grades 6-8) and Prentice Hall Mathematics, Course 1, 2 and 3, 2008, Grades 6-8 **(Available September 2007)**

Saxon Publishers: Saxon Math, 2007, (Grades 4-8) **(Grades 7-8 Available September 2007)**

Scott Foresman Addison Wesley: Mathematics (Arizona), 2005, (Grades K-6)

The University of Chicago School Mathematics Project: Everyday Mathematics, 2007, (Grades K-6)

A copy of the analysis results from one or more publishers is available on request from the Arizona Department of Education. Requests should be emailed to AcadStandards@azed.gov and include the name of the requesting individual and his/ her school or district and the publisher name(s) with specific program names that are being requested.

Arizona Department of Education
K-8 Core Mathematics Program Review Rubric
Program Alignment to Articulated Mathematics Standard

Degree of Alignment	Score	Content	Cognitive Demand	Context
Exceeds	4	The content of the lesson(s) matches and exceeds the Grade Level Expectation.	The cognitive demand of the lesson(s) matches and exceeds the Grade Level Expectation. (verb)	The context of the lesson(s) provides multiple opportunities for students to apply and demonstrate their understanding in multiple ways . In addition, the context of the lesson(s) provides opportunities for extending understanding.
Meets	3	The content of the lesson(s) matches the Grade Level Expectation.	The cognitive demand of the lesson(s) matches the Grade Level Expectation. (verb)	The context of the lesson(s) provides multiple opportunities for students to apply and demonstrate their understanding in multiple ways .
Approaches	2	The content of the lesson(s) matches the Grade Level Expectation to some degree but not completely .	The cognitive demand of the lesson(s) matches the Grade Level Expectation (verb) to some degree but not completely .	The context of the lesson(s) provides multiple opportunities for students to apply and demonstrate their understanding but the opportunities are similar in design .
Falls Far Below	1	The content of the lesson(s) does not match the Grade Level Expectation.	The cognitive demand of the lesson(s) does not match the Grade Level Expectation. (verb)	The context of the lesson(s) provides few/no opportunities for students to apply and demonstrate their understanding.
Not Observed	0	The content of the lesson(s) does not address the Grade Level Expectation.	N/A	N/A